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TI: **Characterization of Ring Wave Spectra for Natural Rain: Measurements and Model for Remote Sensing Applications**

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AB: We measured ring waves generated by natural rains. Time series were obtained (a) from a wire capacitance probe that measured surface elevation, (b) from an optical gauge that measured rain rates R, (c) from an anemometer that measured wind speeds and (d) from a 13.5 GHz scatterometer (vv polarization, and 30o incidence angle).

Ring wave frequency spectra are computed from the surface elevation data for each minute of rain. All the spectra have a similar shape, with a maximum near 5 Hz, and with a more rapid decay towards higher frequencies than towards lower frequencies. A log-Gaussian spectral model provides a useful representation of these data and analysis of the model coefficients shows that the peak frequency and bandwidth are approximately constant, but the magnitude increases as R increases. Additionally, the normalized radar cross section from the scatterometer varies approximately linearly with the spectral line corresponding to the Bragg-wavelength, so together the log-Gaussian ring wave model and the Bragg scattering theory should be useful for a broad range of applications.

Although further studies are needed for storms having high winds and high rain rates, these findings can be used to help interpret remote sensing data during rain events and to guide

model development for radar scattering from rain roughened seas.

DE: 4215 Climate and interannual variability (3309)
DE: 4247 Marine meteorology
DE: 4275 Remote sensing and electromagnetic processes (0689)
DE: 4504 Air/sea interactions (0312)
DE: 4506 Capillary waves
SC: OS
MN: 1998 Fall Meeting

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